

PATENT SPECIFICATION



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PROVISIONAL SPECIFICATION

Improvements in or relating to Free-Wheel Hubs for Cycles and the like.

We, THE BIRMINGHAM SMALL ARMS COMPANY LIMITED, a company duly incorporated under the laws of Great Britain, of Armoury Road, Small Heath, Birmingham, and WILLIAM CHARLES URRY, a British Subject, of the said Company's address, do hereby declare the nature of this invention to be as follows:—

This invention relates to free-wheel hubs for cycles and the like, and refers more particularly to the kind wherein a plurality of chain sprockets of different diameters are provided on the driving sleeve of the hub, for use in conjunction with transmission mechanism comprising a single driving chain, wherein a change or variation in the gear ratio is obtained by moving or transferring the driving chain from either one of said sprockets to another by means of a change over device.

In hubs of the aforesaid kind as hitherto proposed, when it is desired to detach or remove the wheel from the cycle frame, it has been necessary to first detach the chain from the sprocket and the change over mechanism, and the object of the invention is to provide means whereby the aforesaid objection is removed or obviated.

The invention consists in the provision and use of a free-wheel hub comprising a unit adapted to be detachably connected to a driving sleeve on which are carried a plurality of chain sprockets, wherein said driving sleeve is mounted on the one part of a two part axle fixed to the frame of the machine, said driving sleeve being adapted to be connected to the driving member of the free-wheel mechanism by means of facial clutch teeth or other suitable clutch elements.

According to one convenient mode of carrying the invention into effect we provide a driving sleeve adapted to have mounted on the screw-threaded periphery of same a plurality of chain sprockets of different diameters, said sleeve having formed in its inner diameter inner and

outer ball races to receive bearing balls carried on a short axle adapted to be fixed to the frame of the machine. On the inner face of the aforesaid driving sleeve are formed facial clutch teeth adapted to engage with corresponding clutch teeth formed on the driving member of a free-wheel mechanism mounted within the wheel hub, the aforesaid driving member being provided with inner and outer ball races, the outer race being arranged to carry bearing balls supporting one end of the hub, while the inner race carries bearing balls supported on a bearing cone fixed to one end of a sleeve or tubular member which has adjustably mounted on its other end a bearing cone carrying bearing balls supporting the other end of the wheel hub.

In the inner end of the aforesaid short fixed axle carrying the driving sleeve on which are mounted a plurality of chain sprockets, is formed a central tapped hole to receive the screw-threaded end of an axle which passes through the sleeve or tubular member on which is mounted the wheel hub, the outer end of said axle being supported in the frame of the machine.

Between the end of the hub and the side of the frame of the machine in which the detachable part of the axle is carried is preferably mounted a short distance piece of a width approximately corresponding to that of the depth of the aforesaid clutch teeth, which permits, when the said detachable part of the axle and the distance piece have been removed, of the disengagement of the clutch connection and the ready removal of the wheel without forcing open the rear fork ends of the cycle frame, thus leaving fixed and undisturbed the driving sleeve carrying the chain sprockets and rendering unnecessary the detachment of the chain.

Dated this 16th day of August, 1943.

ERNEST W. JONES,
Agent for the Applicants.

free-wheel mechanism are supported on a hollow sleeve 31, bearing cones 33 and ball bearings 35 being provided to facilitate rotation of the hub about the sleeve 31. To exclude grit and other foreign matter from the free-wheel mechanism shields or covers 37 and 39 are provided as shown in Figures 1 and 2 of the drawings.

10 In the inner end of the short fixed axle 9 is formed a central tapped hole 41 to receive the screw-threaded end of an axle 43 which passes through the sleeve 31, the outer end of said axle being received in the other arm of the rear forks of the machine as seen in Figure 1.

Between the end of the hub and the slotted end of the frame 11 in which the axle 43 is received is mounted a short distance piece 45 of a width slightly larger than the depth of the clutch teeth 17, which, as shown in Figure 2, permits, when the axle 43 and the distance piece have been removed, of the disengagement of the clutch connection 15, 17 and the ready removal of the wheel without forcing open the rear fork ends of the cycle frame while leaving fixed and undisturbed the sleeve 1 carrying the chain sprockets 3 and rendering unnecessary the detachment of the chain.

35 Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A free-wheel hub comprising an axle unit adapted to be secured to the frame of a bicycle or the like and having rotatably mounted thereon a member 40 carrying chain sprockets of different sizes and provided with a plurality of clutch teeth, a hub unit consisting of a hub shell, a hollow sleeve extending longitudinally therethrough about which the 45 shell may rotate, and ratchet and pawl free-wheel mechanism rotatably carried on the hollow sleeve and situated in the interior of the hub shell, further clutch teeth on a driving member of the free- 50 wheel mechanism adapted to interengage with the first-mentioned clutch teeth and an axle member passing through said sleeve arranged to be threaded to said axle unit to maintain the respective 55 clutch teeth in inter-engagement but upon separation of the axle member from the axle unit to allow the hub unit to be removed from the bicycle without disturbing the position of the axle unit. 60

2. A free-wheel hub according to Claim No. 1 wherein the chain - sprocket carrying member carries three sprockets of different sizes.

3. A free-wheel hub constructed and 65 arranged substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 16th day of August, 1944.

S. CLARK,

Agent for the Applicants.

[This Drawing is a reproduction of the Original on a reduced scale.]

